



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,168	12/31/2003	Karl L. King	27441.002	3397
36122	7590	02/04/2005	EXAMINER	
SETTER OLLILA, LLC 2060 BROADWAY SUITE 300 BOULDER, CO 80302			SUAREZ, FELIX E	
			ART UNIT	PAPER NUMBER
			2857	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/751,168

Applicant(s)

KING ET AL.

Examiner

Felix E Suarez

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-7,9-17,19,21-23 and 25-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7,9-17,19,21-23 and 25-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Withdrawal of allowability of claims, rejection on new art***

1. The indicated allowability of claims 8-11 and 24-27 are withdrawn in view of the newly discovered reference(s) to Schlager et al. (U.S. Patent No. 6,780,306). Rejections based on the newly cited reference(s) follow.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5-7, 9-17, 19, 21-23 and 25-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiung et al. (U.S. Patent Application Publication No. 2003/0109951) in view of Schlager et al. (U.S. Patent No. 6,780,306).

With respect to claims 1 and 17, Hsiung et al. (hereafter Hsiung) teaches a method of operating a process analysis system to analyze a process, the method (or process analysis system) comprising:

in a plurality of sensors, monitoring the process to generate sensor signals (see page 3, paragraphs [0029]-[0030]), wherein the process comprises a

system that supplies water (see page 1 paragraph [0004] and pages 24-25, TABLE 2 Flow Rate Sensor Type);

in a processing system, processing the sensor signals to detect a deviation from a baseline for the process (see page 6 paragraph [0057] and page 13, paragraphs [0162], [0164]);

in the processing system, generating a process vector for the deviation in response to detecting the deviation (see page 6 paragraph [0058]; page 33 paragraph [0428] and page 35 table 10 [Inverse Least Squares]); and

in the processing system, comparing the process vector to a plurality of library vectors to classify the deviation (see page 6, paragraphs [0059], [0063]; page 10, paragraphs [0123]-[0126] and page 11 paragraph [0144]).

Hsiung does not teach, signaling a control system to perform a treatment on the water in response to classifying the deviation as a contaminant in the water.

But Schlager et al. (hereafter Schlager) teaches an electroionic water disinfection apparatus particularly directed to an electrolytic ionic cell configuration forming a part of a dynamic flow system which operates at a significantly low voltage and at very high flow rates in large pipes and channels for treating water including potable water and wastewater. The system further permits construction of a relatively small, compact unit for application in various installations, both large and small. Schlager has found that an ionic cell by appropriate selection of metals for anode and cathode can be operated at a low

voltage and current and at relatively high flow rates generally on the order of hundreds of gallons per minutes encountered in commercial and community water treatment systems, with the treatment of the water occurring during a period of 1 to 2 seconds. This short treatment time allows for a commercially practical treatment system with the necessary significant inactivation of *E. coli* and other coliform indicator bacteria and the like in water/wastewater disinfection systems, and at high flow rates (see Schlager; col. 4, lines 10-27).

Schlager also teaches that the electroionic disinfection (EID) system readily provides water/wastewater disinfection to the required U.S. EPA and state regulatory limits. A typical wastewater effluent permit limit is 400 fecal coliform organisms/100 ml of water. Drinking water standards are more stringent at the less than 1 fecal coliform microorganism/100 ml of water. In both bench scale and pilot plant testing, the EID system has typically reduced the coliform count to zero or near zero. To provide the necessary microbial cell count, reduction, inactivation rates are expressed in a log.sub.10 reduction where 1-log is equivalent to 90% reduction, 2-log (99.0%) and 3-log (99.9%), etc. In a typical wastewater utility with an initial coliform cell count of 2000-4000 cells/100 ml, a 2-log (99.0%) reduction is more than adequate to comply with regulatory limits. In a drinking water utility, where the initial pre-disinfection counts are typically lower (10-100 cells/100 ml), a 3-log (99.9%) may be necessary to reach the 1 cell/100 ml limit. In the subject invention, current density adjustments in response to

either off-line or on-line microbial count monitoring allows for continuing compliance at minimal electric power usage (see Schlager; col. 10, lines 41-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hsiung to include the electroionic water disinfection apparatus as taught by Schlager, because the electroionic water disinfection apparatus of Schlager operates at a significantly low voltage and at very high flow rates in large pipes and channels for treating water including potable water and wastewater; the electroionic water disinfection system provides water/wastewater disinfection according with the required U.S. EPA and the electroionic disinfection system allows to analyze a process or to perform a disinfection treatment on water according with the U.S. EPA and state regulatory limits.

With respect to claims 3 and 19, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches that the sensor signals indicate pH, conductivity, turbidity, chlorine, and total organic carbon of the water (see Hsiung; pages 7-8, paragraphs [0080]-[0081], [0086]).

With respect to claims 5 and 21, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches comprises signaling the control system to operate a valve in response to

classifying the deviation as the contaminant in the water (see Hsiung; page 9 paragraph [109]).

With respect to claims 6 and 22, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches comprises signaling the control system to add a marker to the water in response to classifying the deviation as the contaminant in the water (see Hsiung; page 9 paragraph [0111]).

With respect to claims 7 and 23, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches that the marker comprises a colorant (see pages 23-24, paragraph [0343] and TABLE 5 [Coherence Difference Chart]).

With respect to claims 9 and 25, Hsiung in combination with Schlager teaches all the features of the claimed invention and Schlager further teaches that the treatment comprises adding a disinfectant to the water (see Schlager; 2, lines 50-58 and col. 15, lines 40-52).

With respect to claims 10 and 26, Hsiung in combination with Schlager teaches all the features of the claimed invention and Schlager further teaches that the treatment comprises adding chlorine to the water (see Schlager; col. 8, lines 12-23).

With respect to claims 11 and 27, Hsiung in combination with Schlager teaches all the features of the claimed invention and Schlager further teaches that the treatment comprises exposing the water to ultraviolet radiation (see Schlager; col. 8, lines 3-11).

With respect to claims 12 and 28, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches that processing the sensor signals to detect the deviation from the baseline comprises processing the sensor signals to produce a single variable and comparing the single variable to a threshold (see Hsiung; page 16 paragraph [0192] and page 26, paragraphs [0359]-[0364]).

With respect to claims 13 and 29, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches that generating the process vector for the deviation comprises generating a unit vector (see Hsiung; pages 10, 11; paragraphs [0134]-[141]).

With respect to claims 14 and 30, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches comparing the process vector to the library vectors comprises comparing an

angle between the process vector and one of the library vectors to a threshold (see Hsiung; page 39, paragraphs [0488]-[0489]).

With respect to claims 15 and 31, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches that the library vectors are associated with abnormal operations and classifying the deviation comprises identifying one of the abnormal operations that is associated with one of the library vectors that matches the process vector (see Hsiung; page 39, paragraphs [0483]-[0486] and page 40 paragraph [0500]).

With respect to claims 16 and 32, Hsiung in combination with Schlager teaches all the features of the claimed invention and Hsiung further teaches comprising in response to an unknown classification, storing the process vector as a new one of the library vectors and associating an abnormal operation with the new library vector (see Hsiung; page 15 paragraph [0178] and page 39, paragraphs [0483]-[0486]).

### ***Conclusion***

#### ***Prior Art***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Harrison [U.S. Patent No. 6,301,572] describes an input matrix as a vector of values.


Rose-Pehrsson et al. [U.S. Patent No. 5,469,369] describes a sensor array system.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felix Suarez, whose telephone number is (571) 272-2223. The examiner can normally be reached on weekdays from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on (571) 272-2216. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306 for regular communications and for After Final communications.

January 31, 2005

F.S.

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800